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process for fabricating a device including one or more ohmic contacts formed using a process described herein.

In an embodiment, the invention provides a method of designing and/or fabricating a circuit that includes one or more of the devices designed and fabricated as described herein. To this extent, FIG. 5 shows an illustrative flow diagram for fabricating a circuit 126 according to an embodiment. Initially, a user can utilize a device design system 110 to generate a device design 112 for a semiconductor device as described herein. The device design 112 can comprise program code, which can be used by a device fabrication system 114 to generate a set of physical devices 116 according to the features defined by the device design 112. Similarly, the device design 112 can be provided to a circuit design system 120 (e.g., as an available component for use in circuits), which a user can utilize to generate a circuit design 122 (e.g., by connecting one or more inputs and outputs to various devices included in a circuit). The circuit design 122 can comprise program code that includes a device designed as described herein. In any event, the circuit design 122 and/or one or more physical devices 116 can be provided to a circuit fabrication system 124, which can generate a physical circuit 126 according to the circuit design 122. The physical circuit 126 can include one or more devices 116 designed as described herein.

In another embodiment, the invention provides a device design system 110 for designing and/or a device fabrication system 114 for fabricating a semiconductor device 116 as described herein. In this case, the system 110, 114 can comprise a general purpose computing device, which is programmed to implement a method of designing and/or fabricating the semiconductor device 116 as described herein. Similarly, an embodiment of the invention provides a circuit design system 120 for designing and/or a circuit fabrication system 124 for fabricating a circuit 126 that includes at least one device 116 designed and/or fabricated as described herein. In this case, the system 120, 124 can comprise a general purpose computing device, which is programmed to implement a method of designing and/or fabricating the circuit 126 including at least one semiconductor device 116 as described herein.

In still another embodiment, the invention provides a computer program fixed in at least one computer-readable medium, which when executed, enables a computer system to implement a method of designing and/or fabricating a semiconductor device as described herein. For example, the computer program can enable the device design system 110 to generate the device design 112 as described herein. To this extent, the computer-readable medium includes program code, which implements some or all of a process described herein when executed by the computer system. It is understood that the term "computer-readable medium" comprises one or more of any type of tangible medium of expression, now known or later developed, from which a stored copy of the program code can be perceived, reproduced, or otherwise communicated by a computing device.

In another embodiment, the invention provides a method of providing a copy of program code, which implements some or all of a process described herein when executed by a computer system. In this case, a computer system can process a copy of the program code to generate and transmit, for reception at a second, distinct location, a set of data signals that has one or more of its characteristics set and/or changed in such a manner as to encode a copy of the program code in the set of data signals. Similarly, an embodiment of the invention provides a method of acquiring a copy of program code that implements some or all of a

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process described herein, which includes a computer system receiving the set of data signals described herein, and translating the set of data signals into a copy of the computer program fixed in at least one computer-readable medium. In either case, the set of data signals can be transmitted/received using any type of communications link.

In still another embodiment, the invention provides a method of generating a device design system 110 for designing and/or a device fabrication system 114 for fabricating a semiconductor device as described herein. In this case, a computer system can be obtained (e.g., created, maintained, made available, etc.) and one or more components for performing a process described herein can be obtained (e.g., created, purchased, used, modified, etc.) and deployed to the computer system. To this extent, the deployment can comprise one or more of: (1) installing program code on a computing device; (2) adding one or more computing and/or I/O devices to the computer system; (3) incorporating and/or modifying the computer system to enable it to perform a process described herein; and/or the like.

The foregoing description of various aspects of the invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed, and obviously, many modifications and variations are possible. Such modifications and variations that may be apparent to an individual in the art are included within the scope of the invention as defined by the accompanying claims.

What is claimed is:

1. A device heterostructure comprising:

a semiconductor layer;

a protruded region located directly on a first region of a surface of the semiconductor layer; and

an ohmic contact located on a set of contact regions of the surface of the semiconductor layer distinct from the first region of the surface of the semiconductor layer, wherein the ohmic contact is formed without etching the semiconductor layer, and wherein the forming includes:

forming a set of highly conductive semiconducting layers on the set of contact regions, wherein the forming the set of highly conductive semiconducting layers includes grading a molar fraction of at least one element of a material forming the set of highly conductive semiconducting layers with respect to a distance from the set of contact regions; and
forming an ohmic metal on the set of highly conductive semiconducting layers after formation of the protruded region, wherein the forming the ohmic contact is performed at a processing temperature lower than a temperature range within which a quality of a material forming any one of the set of semiconductor layers in the device heterostructure is damaged.

2. The heterostructure of claim 1, further comprising an active region located on the protruded region.

3. The heterostructure of claim 2, the heterostructure further comprising a second contact located on the active region, wherein the ohmic contact is one of: an n-type contact or a p-type contact, and wherein the second contact is the other of: the n-type contact or the p-type contact.

4. The heterostructure of claim 2, wherein the active region is a light emitting active region.

5. The method of claim 1, wherein the semiconducting layers of the heterostructure are formed of group III nitride materials.

6. The method of claim 1, wherein the set of highly conductive semiconducting layers are lattice matched with